

FIN 40500
Solutions to Group Assignment #7

- 1) We have the following regression equation for the annual % change in the British Pound (in dollars per pound) – standard errors are in parentheses.

$$\% \Delta e = .06 + 1.31(\pi - \pi^*) + .84(\% \Delta e_{-1}) + \varepsilon$$

(.04) (.32) (.44) (1.70)

We also have the following data:

$$(\pi - \pi^*) = (3.5 - 4) = -.5\%$$

$$\% \Delta e_{-1} = \left(\frac{1.8941 - 1.8765}{1.8765} \right) 100 = .94\%$$

Therefore, the mean % change in the exchange rate is

$$\% \Delta e = .06 + 1.31(-.5) + .84(.94) + 0 = .1946\%$$

The Standard deviation of this forecast is

$$SD = \sqrt{(.04)^2 + (-.5)^2(.32)^2 + (.94)^2(.44)^2 + (1.70)^2} = 1.76$$

Likewise for the South Korean Won, we have the following equation (standard errors in parentheses)

$$\% \Delta e = -.04 + .31(\% \Delta TB) - 1.84(i - i^*) + \varepsilon$$

(.01) (.13) (.64) (1.22)

We also have the following data:

$$(i - i^*) = (5.75 - 6) = -.25\%$$

$$\% \Delta TB = \left(\frac{104 - 92}{92} \right) 100 = 13\%$$

Therefore, the mean % change in the exchange rate is

$$\% \Delta e = -.04 + .31(13) - 1.84(-.25) + 0 = 4.45\%$$

The Standard deviation of this forecast is

$$SD = \sqrt{(.01)^2 + (13)^2(.13)^2 + (-.25)^2(.64)^2 + (1.22)^2} = 2.09$$

- 2) Given an expected percentage change in the Won of 4.45% over the coming year, the future Won exchange rate is expected to be $(0.00104)(1.0445) = .001086$ dollars per won. Therefore, your expected dollar sales are

$$50,000(75,000)(.001086) = \$4,072,500$$

- 3) We need to get the standard deviation of our South Korean sales. Given the standard deviation of our forecast of 2.09%, this gets scaled up by our dollar sales.

$$SD = (.0209)(4,072,500) = \$85,115$$

The 95% confidence interval is 2 standard deviations around the mean

$$\$4,072,500 \pm 2(85,115)$$

- 4) Now, we have 75,000 sales in Britain at a price of L45 and 50,000 sales in S. Korea at a price of 75,000 Won. Given the expected Won price of .001086 dollars per won and the expected Pound price of 1.8941(1-.001946) = \$1.89, our total sales are expected to be

$$(50,000)(75,000)(.001086) + (75,000)(45)(1.8941) = \$10,465,087$$

Note that $(4072,500/10,465,087) = .39$ - 39% of sales are in S. Korea and 61% are in Britain. We need to calculate the standard deviation of this linear combination of the two exchange rates:

$$SD = \sqrt{(.39)^2(.0209)^2 + (.61)^2(.0176)^2 + 2(.39)(.61)(.0209)(.0176)(-.73)} = .007344$$

Therefore, we have a SD of .734%.

.734% of \$10,465,087 is \$76,855

Therefore, our interval is $\$10,465,087 \pm 2(76,855)$

- 5) Plugging the above formula into excel and plying with the weights give us the following:

45% in S. Korea and 55% in Britain minimizes currency volatility.

- 6) Your expected costs in Won will be

$(105,000)(34,000)(.001086) = \$3,877,020$. Therefore, your net cash flows from S. Korea are $\$4,072,500 - \$3,877,020 = \$195,480$.

Total cash flows are $\$6,392,587 + \$195,480 = \$6,588,067$

97% are coming from Britain, 3% are coming from S. Korea. Repeating the earlier process:

$$SD = \sqrt{(.03)^2 (.0209)^2 + (.97)^2 (.0176)^2 + 2(.03)(.97)(.0209)(.0176)(-.73)} = .0166$$

1.66% of $\$6,588,067$ is $\$109,361$

Therefore, our confidence interval, is $\$6,588,067 \pm 2(109,361)$